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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/493,258	01/28/2000	Xin Li	723-824	2008

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EXAMINER	
GOOD JOHNSON, MOTILEWA	

ART UNIT	PAPER NUMBER
2672	24

DATE MAILED: 03/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/493,258	LI ET AL.	
	Examiner	Art Unit	
	Motilewa A. Good-Johnson	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 December 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-14 and 16-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *9, 10, 21, 22, 28-31* is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in responsive to the following communications: Application, filed on 01/28/2000; IDS, paper #6, filed on 06/08/2000; IDS, paper #9, filed on 10/12/2001; Preliminary Amendment A, filed 01/28/2000; Amendment B, filed 12/16/2002; Amendment C, filed 05/27/2003; Amendment D, filed 12/16/2003; Amendment E, filed 12/18/2003.

This action is made final.

2. Claims 1 and 3-34 are pending in this application. Claims 1, 9, 10, 14, 22, 23, 27-34 are independent claims. Claim 2 and 15 has been canceled.

3. The present title of this application is "Incremental Interlace Interpolation for Texture Morphing" (as originally filed).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims 1, 3-8, 11-14, 16-21, 24-27 and 32-34 are rejected under 35 U.S.C. 102(a) as being anticipated by Blanz et al., *A Morphable Model for the Synthesis of 3D Faces,* ACM SIGGRAPH 1999, pages 187-194.

As per independent claim 1, a method for morphing and displaying a texture comprising: pre-decomposing at least some texels of a texture map into respective texel color components; (Blanz discloses the texture represented by color components, page 189, section 3) predetermining . . . at least one incremental morph parameter corresponding to said respective texel color components; (Blanz discloses incremental morph parameters calculated by adding to and subtracting from the morphable model, page 189, section 3) using said incremental morph parameter during real-time imaging to incrementally interpolate said texel color . . . ; (Blanz discloses a morphable face model which morphs in increments, page 189, section 3) and displaying an image based at least in part on said intermediate morph texel color state, wherein said incrementally interpolating comprises repetitively adding said predetermined incremental morph parameter to said predetermined texel components to produce a corresponding sequence of intermediate morph texel components states. (Blanz discloses in figure 2)

With respect to dependent claim 3, incrementally interpolating comprises using an integer arithmetic calculation to repetitively increment or decrement said plural texel components based on said predetermined incremental morph parameter. (Blanz discloses an algorithm that adjusts the model parameters automatically, page 188, section 1)

With respect to dependent claim 4, predetermining calculates said incremental morph parameter as the amount of change in said texel components for each successive time period within a morphing procedure, and said incrementally

interpolating changes said texel components . . . (Blanz discloses a model of texture variations between faces in which a morphable face model is an extension of the interpolation technique is introduced, page 188, section 1.1)

With respect to dependent claim 5, successive time periods comprise image frame times. (Blanz discloses extending the database by incorporating additional examples in which time is represented, page 193, section 7)

With respect to dependent claim 6, incrementally interpolating conditions said change in said texel components based on which of said successive time periods has occurred within said morphing procedure to minimize the number of calculations required to morph said texture. (Blanz discloses data reduction applied to shape and texture to reduce redundancy and save computation time, page 193, section 7, therefore making it inherent to add time data to reduce the number of calculations)

With respect to dependent claim 7, selectively adding integers to or subtracting integers from said integer portions to reduce approximation errors in the context of integer arithmetic operations. (Blanz discloses in figure 2, the deviation is added to or subtracted from the average, page 189)

With respect to dependent claim 8, incremental interpolation comprises incrementing or decrementing said texel components by integer approximations of said determined morph parameters, and compensating for approximation errors by performing at least one floating point operating to set said texel components to target texel component values. (Blanz discloses instead of computation of derivatives, using a

global mapping of matching error into parameter space can be used, page 193, section 7)

With respect to dependent claim 11, calculating a frame counter corresponding to said texel components, and selectively incrementing or decrementing said texel components in response to said frame counter. (Blanz discloses data reduction applied to shape and texture to reduce redundancy and save computation time, page 193, section 7)

With respect to dependent claim 12, including the preliminary step of storing said decomposed texel components in separate texel component arrays. (Blanz discloses the texture values represented by a texture vector, page 189, section 3)

With respect to dependent claim 13, texel components comprise red, green, and blue color values and an alpha value. (Blanz discloses the texture vector contains the RGB color values of the corresponding vertices parameterized by coefficients a and b, page 189, section 3)

As per independent claim 14 and dependent claims 16- 21 and 24-26, they are rejected based upon similar rational as above independent claim 1 and dependent claims 3-8 and 11-13 respectively.

As per independent claim 27, it is rejected based upon similar rational as above independent claim 1.

As per independent claim 32,an efficient texture morphing method for morphing and displaying textures using a real time interactive 3D graphics system . . . including: a) before real-time imaging, pre-decomposing said texels into plural texel components

and precalculating incremental morph parameter values . . . to provide integer results and calculating period counter values . . . ; (Blanz discloses incremental morph parameters, represented by shape and texture vectors with color components, calculated by adding to and subtracting from the morphable model, page 189, section 3) b) at least in partial response to user interaction with said controls, changing texel component values at a first periodic frequency based on said integer results; (Blanz discloses data reduction applied to shape and texture to reduce redundancy and save computation time, page 193, section 7, therefore making it inherent to add time data to reduce the number of calculations) c) at least in partial response to said period counter, further changing said texel component values at a second periodic frequency less than said first periodic frequency to compensate for approximation errors . . . (Blanz discloses instead of computation of derivatives during each iteration, using a global mapping of matching error into parameter space can be used, page 193, section 7) and generating an image display based at least in part on said changed and further changed texel component values.

As per independent claim 33, it is rejected based upon similar rational as above independent claim 32. Blanz further discloses extending the face model by interactive animation, page 193, section 7.

As per independent claim 34, it is rejected based upon similar rational as above independent claim 1. Blanz further discloses a database for storage of the information to perform incremental morph calculations, section 2.

Allowable Subject Matter

6. Claims 9, 10, 22, 23 and 28-31 are allowed.

Response to Arguments

7. Applicant's arguments filed 12/18/2003 have been fully considered but they are not persuasive.

Applicant argues that Blanz fails to teach pre-decomposing at least some texels of a texture map into respective texel color components, and states that Blanz teaches a representation that contains the color component values of each of the vertices the shape-vector represents. Blanz discloses a model of texture variations between the images being morphed to represent the model by an algorithm. Blanz discloses representing the texture vector by the color values of the vertices. Applicant argues the texture-vector information is not the texel color components of a pre-decomposed texture map. Examiner disagrees and interprets the texture information represented by color components as the pre-decomposed texels of a texture map with texel color components, furthermore Blanz discloses that for simplicity the texture values in the texture map are equal to the number of vertices and representing the texture by a texture-vector.

Applicant argues that Blanz fails to disclose using a predetermined incremental morph parameter to incrementally interpolate the texel color components. Blanz discloses using an algorithm using shape and texture data to model the deformation of

morphable models. Blanz further discloses incremental morph parameters calculated by adding to and subtracting from the morphable model, page 189, and section 3.

Applicant argues that Blanz fails to disclose condition incremental interpolation on which of successive time periods has occurred, using a frame counter, interpolating during successive frame time or integer arithmetic. Blanz discloses multiples of the shape and texture can be added to or subtracted from any face and further discloses for shape and texture coefficients using a constant factor, which examiner interprets as integer arithmetic, page 190, col. 1. Blanz discloses computing the optic flow algorithm performed with a smooth interpolation computed on several consecutive levels of resolution, page 192, section 5.1, which Examiner interprets as incremental interpolation or interpolation during successive frame time. Blanz further discloses a recursive step that is implemented to morph the existing model, which Examiner interprets as a frame counter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Motilewa A. Good-Johnson whose telephone number is (703) 305-3939. The examiner can normally be reached on Monday - Friday 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Razavi can be reached on (703) 305-4713. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

Motilewa A. Good-Johnson
Examiner
Art Unit 2672

mgj
March 1, 2004

MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600